CLAIMS

1.   A method for operating a network system having a content provider which provides content over a network through local service providers to multiple content rendering units, the method comprising the following steps:

     identifying a peak time when a plurality of the content rendering units are likely to request the content supplied by the content provider;

     sending at least some of the content from the content provider to the local service provider prior to the peak time; and

     storing the content received from the content provider at the local service provider for use during the peak time.

2.   A method as recited in claim 1, wherein the sending step is performed without being requested by the content rendering units.

3.   A method as recited in claim 1, wherein the content comprises streaming audio or video data.

4.   A method as recited in claim 1, further comprising the step of requesting, by the local service provider, the content based on the results of the identifying step.

5.   A method as recited in claim 1, and further comprising:

     monitoring usage patterns of the content;

     scheduling early sending of the content at a time prior to the peak time based on the usage patterns.

6. A method as recited in claim 1, and further comprising the step of serving the content from the local service provider to requesting content rendering units during the peak time.

7. A method as recited in claim 1, wherein:

the identifying step comprises designating a peak time in terms of discrete time slots as covering an ending portion of at least one time slot and a beginning portion of at least one subsequent time slot; and

the sending step comprises sending the content that is likely to be requested in the subsequent time slot prior to the peak time.

8. A method as recited in claim 1, and further comprising the following steps:

customizing a set of prioritized content according to requests made by the content rendering units; and

selectively sending the set of prioritized content to the local service provider prior to the peak time.

9. A method as recited in claim 1, and further comprising the step of assigning a time-to-live tag to the content to indicate when the content is expected to be updated.

10.   A method as recited in claim 1, and further comprising the step of estimating, at the local service provider, a time-to-live tag for the content received from the content provider to indicate when the content is expected to be updated.

11.   A method as recited in claim 10, wherein the estimating step comprises deriving the time-to-live tag based upon a time since the content was last updated.

12.   In a network system having a content provider which provides content over a network through a local service provider to multiple content rendering units, a method for operating a local service provider comprising the following steps:

    monitoring usage patterns to detect highly requested content;

    identifying from the usage patterns a peak time when a plurality of the content rendering units are likely to request the content;

    scheduling delivery of the highly requested content at a scheduled time prior to the peak time;

    receiving the highly requested content from the content provider at the scheduled time prior to the peak time; and

    storing the highly requested content received from the content provider for use during the peak time.

13.   A method as recited in claim 12, wherein the content comprises streaming audio or video data.

14. A method as recited in claim 12, and further comprising the step of modifying target specifications, which are used by the local service provider to reference the content stored at the content provider, to instead reference the content stored at the local service provider.

15. A method as recited in claim 12, and further comprising the step of serving the stored content to requesting content rendering units during the peak time.

16. A method as recited in claim 12, and further comprising the step of estimating, at the local service provider, a time-to-live tag for the content received from the content provider to indicate when the content is expected to be updated.

17. A method as recited in claim 16, wherein the estimating step comprises deriving the time-to-live tag based upon a time since the content was last updated.

18. A computer programmed to perform the steps in the method as recited in claim 16.

19. A method for operating a network system having a content provider which provides content through a local service provider to multiple content rendering units, the content being provided from the content provider to the local service provider over a first network, the method comprising the following steps:

distributing supplemental content from the content provider to the local service provider over a second network; and

storing selected portions of the supplemental content received from the content provider in a cache at the local service provider for use in serving the content rendering units.

20.   A method as recited in claim 19, wherein the supplemental content comprises streaming audio or video data.

21.   A method as recited in claim 19 wherein the second network comprises a satellite network and the distributing step comprises the step of broadcasting the supplemental content.

22.   A method as recited in claim 19, and further comprising the step of choosing the selected portions of the supplemental content to be stored at the local service provider based upon usage patterns exhibited by the content rendering units.

23.   A method as recited in claim 19, and further comprising the step of serving the distributed content from the local service provider to requesting content rendering units.

24.   A method as recited in claim 19, and further comprising the following steps:

identifying a peak time when a plurality of the content rendering units are likely to request the content stored at the content provider; and

distributing the supplemental content from the content provider to the local service provider over the second network prior to the peak time.

25.   A method as recited in claim 19, and further comprising the step of assigning a time-to-live tag to the supplemental content to indicate when the content is expected to be updated.

26.   A method as recited in claim 19, and further comprising the step of estimating, at the local service provider, a time-to-live tag for the supplemental content received from the content provider to indicate when the supplemental content is expected to be updated.

27.   A method as recited in claim 26, wherein the estimating step comprises deriving the time-to-live tag based upon a time since the supplemental content was last updated.

28.   A system for providing content to user content rendering units, comprising:

a content provider having storage for storing the content;

at least one local service provider to facilitate access to the content stored at the content provider on behalf of the content rendering units;

a distribution network interconnecting the program provider and the local service provider; and

the local service provider being configured to request certain content from the content provider prior to a peak time when multiple content rendering units are likely to request the content and to cache the content received from the content provider for serving to requesting content rendering units during the ensuing peak time.

29. A system as recited in claim 28, wherein the local service provider using target specifications to request the content stored at the content provider for serving to the content rendering units, the local service provider modifying the target specifications to reference the content cached at the local service provider instead of referencing that same content at the content provider.

30. A system as recited in claim 28, wherein the content provider assigns a time-to-live tag to the content to indicate when the content is expected to be updated.

31. A system as recited in claim 28, wherein the local service provider is configured to estimate a time-to-live tag for the content to indicate when the content is expected to be updated.

32.   A system as recited in claim 28, and further comprising at least one content rendering unit connected to the local service provider to facilitate access to the content served by the content provider, the local service provider serving the content cached locally to the content rendering unit during the peak time.

33.   A system for providing content to user content rendering units, comprising:

a content provider having storage for storing the content;

at least one local service provider to facilitate access to the content stored at the content provider on behalf of the content rendering units;

an interactive network interconnecting the content provider and the local service provider;

a broadcast network;

the content provider being configured to broadcast at least some of the content over the broadcast network to the local service provider; and

the local service provider being configured to cache the broadcasted content for serving to requesting content rendering units.

34.   A system as recited in claim 33, wherein the broadcast network comprises a satellite network.

35.   A system as recited in claim 33, wherein the local service provider uses target specifications to request the content stored at the content provider for serving to the content rendering units, the local service provider being configured to modify the target specifications to reference the broadcasted content cached at the local service provider instead of referencing that same content at the content provider.

36.   A system as recited in claim 33, wherein the content provider assigns a time-to-live tag to the broadcasted content to indicate when the content is expected to be updated.

37.   A system as recited in claim 33, wherein the local service provider is configured to estimate a time-to-live tag for the broadcasted content to indicate when the broadcasted content is expected to be updated.

38.   A system as recited in claim 33, and further comprising at least one content rendering unit connected to the local service provider to facilitate access to the content served by the content provider, the local service provider serving the content cached locally to the content rendering unit.

39.   A local service provider for facilitating delivery of continuous data content from a content provider to individual content rendering units, the content serving unit comprising:

a computer programmed to detect a peak time when the content rendering units are likely to request the particular target resource and to schedule a request for the particular target resource at a selected time prior to the peak time;

a cache memory to store the particular target resource received from the content provider in response to the scheduled requests;

a continuous media server to store any continuous data files referenced in the particular target resource; and

the computer being further programmed to serve the particular target resource stored in the cache memory to a content rendering unit during the peak time, and if requested by the content rendering unit, to initiate transmission of a continuous data file from the continuous media server that is referenced in the target resource.

40.   A local service provider as recited in claim 39, wherein the target resource in the cache memory contains target specifications to remote locations where the continuous data files are stored remotely from the content serving unit, and the computer is programmed to change the target specifications within the cached target resource to reference the continuous data files stored in the continuous media server.

41. A local service provider as recited in claim 39, wherein the computer is programmed to estimate a time-to-live tag for the target resources received from the content provider to indicate when the target resources are expected to be updated.

42. A content serving unit for facilitating delivery of content from a content provider to individual content rendering units, the content serving unit comprising:

a computer;

a storage medium connected to the computer;

a network port responsive to the computer to request and receive content from the content provider over a network;

a receiver to receive a signal from the content provider, the signal carrying additional content; and

the computer being programmed to store the additional content received at the receiver in the storage medium.

43. A content serving unit as recited in claim 42, wherein the computer is programmed to monitor usage patterns of the content and to schedule requests for the content so that the content is received from the content provider at a time prior to the peak time.

44.   A content serving unit as recited in claim 42, wherein the computer is programmed to serve the additional content stored in the storage medium to a content rendering unit in response to a request from the content rendering unit.

45.   A content serving unit as recited in claim 42, further comprising:

a memory to store target specifications for referencing the content at the content provider; and

the computer being programmed to change the target specifications to reference the content stored in the storage medium instead of referencing that same content at the content provider.

46.   A content serving unit as recited in claim 42, wherein:

the network port comprises a connector compatible with a wire-based communications network; and

the receiver comprises a receiver capable of receiving signals conveyed through a wireless medium.

47.   A content serving unit as recited in claim 42, wherein the computer is programmed to estimate a time-to-live tag for the content received from the content provider to indicate when the content is expected to be updated.

48.   A content provider, comprising:

a storage system to store content;

a server connected to the storage system to serve the content to requesting clients; and

the server being programmed to serve early at least some of the content to the clients prior to a peak time when the clients are likely to request the content.

49.   A content provider as recited in claim 48, wherein the server is programmed to assign a time-to-live tag to the content to indicate when the content is expected to be updated.

50.   A content provider as recited in claim 48, wherein the server serves multiple clients, the server being programmed to serve early different sets of content for different ones of the clients.

51.   A content provider, comprising:

a storage system to store content;

a server connected to the storage system to serve the content to requesting clients;

a network port adapted for connection to a network, the server serving the content through the network port to the clients in response to requests from those clients; and

a transmitter, responsive to the server, to transmit content over a second network to the clients.

52.   A content provider as recited in claim 51, wherein:

the network port comprises a connector compatible with a wire-based communications network; and

the transmitter comprises a transmitter capable of transmitting signals over a wireless medium.

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